

Claims 1-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nagaraj et al. (5,723,078). Nagaraj et al. teach a method of localized repair of turbine blade components having a surface with a damaged thermal barrier coating (column 4, lines 35-45) including cleaning (preferably by grit blasting) a spalled region of the exposed surface of the component (column 4, lines 46-51), texturing the exposed surface to produce an array of grooves (column 4, lines 61-column 5, line 10), and depositing a replacement thermal barrier coating over substantially only the textured surface (column 5, line 21-line 44). Nagaraj et al. fail to state that the spacing, geometry, etc of the grooves is predetermined. However, it is common practice in mechanical manufacture to evaluate and optimize design characteristics prior to implementation and then to follow those design criteria and official notice is taken of such.

Applicant respectfully traverses this rejection. As the Examiner notes, not all of the claim limitations are included in the prior art reference relied upon by the Examiner. Yet, MPEP 2143.03 clearly requires that all claim limitations must be taught or suggested. MPEP 2143.03 states:

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

In addition, the MPEP clearly indicates that the prior art must be considered in its entirety, including disclosures that teach away from the claims. As set forth in MPEP 2141.02:

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) (Claims were directed to a process of producing a porous article by expanding shaped, unsintered, highly crystalline poly(tetrafluoroethylene) (PTFE) by stretching said PTFE at a 10% per second rate to more than five times the original length. The prior art teachings with regard to unsintered PTFE indicated the material does not respond to conventional plastics processing, and the material should be stretched slowly. A reference teaching rapid stretching of conventional plastic polypropylene with reduced crystallinity combined with a reference teaching stretching

unsintered PTFE would not suggest rapid stretching of highly crystal-line PTFE, in light of the disclosures in the art that teach away from the invention, i.e., that the conventional polypropylene should have reduced crystallinity before stretching, and that PTFE should be stretched slowly.).

The Nagaraj et al. reference is discussed in the specification at paragraph 10. As understood, this reference does disclose a method for repairing localized damage to a thermal barrier coating. Furthermore, the Applicant agrees with all that the Examiner has stated about Nagaraj et al. However, when considered in its entirety, as directed by the MPEP, Nagaraj et al. clearly is directed to applying a surface finish texture to the underlying bond coat and not to a geometry with the specific features taught by Applicant. Applicant is directed to column 5, lines 10-20 in which Nagaraj et al. clearly indicates that the treatment method selected should sufficiently texture the surface of the bond coat to yield an average surface roughness of at least about 300 micrometers. This surface finish texture of Nagaraj et al. does not disclose or suggest the geometric features claimed by the Applicant.

The Examiner further states:

Nagaraj et al. further fail to teach the particulars of the texturing apparatus (laser beam particulars or electron beam) and the particulars of the groove size and spacing. However, the particulars of the apparatus used to perform the texturing are considered apparatus limitations which do not materially effect the method performed and are considered to be routinely determined through design optimization. Further the shape, spacing, etc of the grooves are considered design limitations which would have been obvious to one of ordinary skill in the art at the time the invention was made since it is old and well known to optimize article design features through routine experimentation.

Furthermore whether it is the bond coat or the substrate, which is textured would depend on the extent of damage and how much to remove, etc, would be obvious to one of ordinary skill in the art based on an observation of the damaged article.

The article of claim 27 inherently results from the method of Nagaraj et al.

Applicant respectfully traverses this rejection. First of all, as understood by Applicant, Nagaraj et al. sets forth the particulars of texturing apparatus at col. 4, line 61-col.5, line 3. Mechanical indenters and cutting tools are specifically identified and Applicant assumes that grit blasting utilizes grit blasting equipment, water jet techniques utilize water jet equipment etc.

Applicant further submits that the particulars are in fact given in col. 5, lines 10-20, discussed above, in which the selected method yields a surface roughness of 300 R<sub>a</sub>. Applicant further submits that one skilled in the art provided with the teachings of Nagaraj et al. regarding surface texturing would not be motivated to provide the specific geometries, spacings and angles taught by Applicant, as these claim limitations are not taught or suggested in Nagaraj et al.

Applicant respectfully submits that the modifications to Nagaraj et al. suggested by the Examiner appear to be based on impermissible hindsight, which of course is not permitted. It would appear that the Examiner is motivated to make the suggested modifications to Nagaraj et al. only after being exposed to the knowledge and teachings contributed by Applicant. As routine experimentation with surface roughness textures would not lead to Applicant's invention. Specifically, MPEP 2141.01 states:

III. CONTENT OF THE PRIOR ART IS DETERMINED AT THE TIME THE INVENTION WAS MADE TO AVOID HINDSIGHT

Requirement for "at the time the invention was made" is to avoid impermissible hindsight. See MPEP § 2145, paragraph X.A. for a discussion of rebutting Applicants' arguments that a rejection is based on hindsight." It is difficult but necessary that the decisionmaker forget what he or she has been taught . . . about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

With regard to the apparatus limitations discussed by the Examiner, Applicant has included and claimed the best mode for obtaining the geometry set forth in his invention, which includes both the equipment which can best be utilized to provide the desired geometry, and the parameters for operating the equipment to achieve the desired geometry. It is well within the scope of the patent statute to claim the best mode contemplated for practicing one's invention.

Applicant further notes that claim 12, claiming a set of intersection grooves, the grooves within each set being parallel with one another is nowhere contemplated by Nagaraj et al. Nor does Nagaraj et al. teach or suggest a geometry having a groove depth in which the groove depth

does not exceed the thickness of the deposited ceramic material as claimed in claim 13. Finally, Nagaraj, unlike Applicant's invention, does not contemplate or otherwise suggest texturing the substrate and then applying a bond coat over the textured substrate, such as claimed in claim 16.

Based on the above, Applicant respectfully requests withdrawal of the rejection of claims 1-27 under 35 U.S.C. §103(a) based on Nagaraj et al.

### CONCLUSION

Applicant respectfully requests the entry of the present amendment and the withdrawal of the rejection of claims 1-27 under 35 U.S.C. §103(a) and respectfully requests allowance of claims 1-27, which Applicant respectfully submits are in condition for allowance. Applicant further requests allowance of claims and issuance of the application. A timely and favorable action is earnestly solicited. A one-month extension of time is submitted with this response.

The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to Deposit Account No. 50-1059.

Respectfully submitted,  
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